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THE
FORTY-FIFTH ANNUAL REPORT
OF THE
BOARD OF DIRECTORS
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MUS. COMP. ZOOLOGY
OF THE
ZOOLOGICAL SOCIETY
OF PHILADELPHIA.

(INCORPORATED MARCH 21ST, 1859.)

READ AT THE ANNUAL MEETING OF THE MEMBERS AND LOAN-
HOLDERS OF THE SOCIETY.

APRIL 26th, 1917.

PHILADELPHIA:
PRESS OF ALLEN, LANE & SCOTT,
1211-1213 Clover Street,
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THE
ZOOLOGICAL SOCIETY OF PHILADELPHIA.
(FAIRMOUNT PARK.)

BOARD OF DIRECTORS:

ELECTED BY THE SOCIETY.

CHARLES B. PENROSE, M. D., <i>President.</i>	W. B. CADWALADER, M. D., <i>Secretary.</i>
CHARLES M. LEA, SAMUEL G. DIXON, M. D., <i>Vice-President.</i>	ROBERT G. LE CONTE, M. D., HENRY PRATT McKEAN, CLEMENT B. NEWBOLD, CHARLES S. W. PACKARD, <i>Treasurer.</i>
CHRISTIAN C. FEBIGER, <i>Vice-President.</i>	GEORGE L. HARRISON, JR., ALFRED GRATZ, RICHARD H. HARTE, M. D. WILLIAM L. ABBOTT, M. D. WM. H. FURNESS 3d, M. D.
THOMAS DEWITT CUYLER, OWEN WISTER, D. M. BARRINGER, WILLIAM D. WINSOR,	

ELECTED BY THE CITY COUNCILS.

JAMES E. LENNON, EDWARD B. GLEASON, M. D.

SUPERINTENDENT OF THE GARDEN.

ROBERT D. CARSON.

CLERK.

F. ROBERT GILPIN.

PATHOLOGIST.

HERBERT FOX, M. D.

ASSISTANT PATHOLOGIST.

FRED D. WEIDMAN, M. D.

SOLICITOR.

W. W. MONTGOMERY.

REPORT

OF THE

BOARD OF DIRECTORS.

PHILADELPHIA, April 26th, 1917.

The Board of Directors of the Zoological Society of Philadelphia presents to the members and loanholders its forty-fifth annual report, for the year ending February 28th, 1917.

GENERAL AFFAIRS AND FINANCES.

The number of members at the close of the year was:—

Annual members.....	179
Life members.....	996
Honorary members.....	10
Perpetual memberships.....	245
Junior members.....	42
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Total members.. ..	1,472

The following is a report in detail of the admissions and receipts for the year:—

Adults (paying at gates).....	145,930
Children (paying at gates).....	40,111
Members (including life and annual members, loan- holders' annual, and complimentary annual tickets)	1,501
Loanholders' single tickets.....	4,156
Free admissions (charitable institutions, donors' tickets, &c.)*.....	5,166
Coupon tickets.....	87
Excursion tickets.....	596
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	197,547

* In addition to these, 250,000 tickets were issued to the Board of Education, for the admission of pupils of the Public Schools.

*Monthly Record of Receipts from Admissions for 1916-1917
with corresponding account for 1915-1916.*

MONTH	1915-1916	1916-1917	COMPARISON
March.....	\$1,249 65	\$1,299 25	Increase \$49 60
April.....	1,893 95	3,295 85	Increase ... 1,401 90
May.....	3,106 65	3,462 15	Increase.... 355 50
June.....	2,856 95	3,444 25	Increase.... 587 30
July.....	3,736 45	5,046 60	Increase.... 1,310 15
August.....	4,336 30	3,639 75	Decrease... 696 55
September..	3,513 55	3,373 80	Decrease... 139 75
October....	3,363 15	3,457 70	Increase.... 94 55
November..	1,749 45	2,051 40	Increase.... 301 95
December..	821 35	1,300 40	Increase.... 479 05
January....	993 70	1,037 25	Increase.... 43 55
February...	566 20	1,313 90	Increase.... 747 70
	\$28,187 35	\$32,722 30	Increase.... 4,534 95

It is gratifying to be able to report a substantial increase in the gate receipts for the year.

The expenditure for animals has been nearly twice as much as that of the preceding year, but on account of the European war the difficulty of obtaining specimens from foreign countries has continued.

The Society has been fortunate in being able to co-operate with Dr. William T. Hornaday of the New York Zoological Society and the National Zoological Park in Washington, by subscribing \$2000 as their share to defray the expenses of sending Mr. J. Alden Loring to South Africa to collect animals. Mr. Loring returned in January with a number of specimens and having made arrangements for future purchases.

The Southern entrance to the Garden has been removed to a new location on Thirty-fourth Street, where a new gate house has been erected and from which a new asphalt walk has been laid.

In addition many of the old walks have been rebuilt. During the year a total of 4916 square yards of asphalt have been laid down.

The new bird house was opened on October 4th. It has proved to be most satisfactory and an added attraction to visitors. Many minor improvements and repairs have been completed during the year, as well as planting of trees and shrubbery.

The Board of Directors announce with regret the death on April 15th, 1916, of Dr. Norton Downs and the death of Mr. Charles Platt, Jr., on October 3d, 1916.

Dr. Downs became a Director of the Society December 15, 1904, and a member of the Executive Committee in 1905.

Mr. Platt became a Director of the Society in 1900. The long service of these gentlemen was highly valued by the Board of Directors and the Society.

The thanks of the Board are extended to all from whom favors have been received.

By order of the Board of Directors.

WILLIAMS B. CADWALADER,
Secretary.

TREASURER'S REPORT.

INCOME AND EXPENDITURES.

For the fiscal year ending February 28th, 1917.

INCOME.

Admission receipts.....	\$32,722.30	
Rents at Garden.....	250.00	
Interest.....	2,760.13	
Sale of animals.....	632.50	
Sale of guides.....	60.15	
Donkey rides.....	778.80	
Sundry receipts.....	1,727.41	
Received from the City of Philadelphia through the Commissioners of Fairmount Park.....	50,000.00	
Total income.....		<u>\$88,931.29</u>

EXPENDITURES.

Salaries.....	\$27,810.58	
Office expenses.....	823.54	
General expenses.....	44,825.99	
Purchase of animals.....	8,525.25	
Permanent improvements.....	2,991.46	
Due for reimbursement of Emergency Fund.....	3,500.00	
Total expenditures.....	\$88,476.82	
Excess of income over expenditures.....	454.47	
		<u>\$88,931.29</u>

CAPITAL.

For the fiscal year ending February 28th, 1917.

RECEIPTS.

Received from the City of Philadelphia through the Commissioners of Fairmount Park.....	\$15,000.00
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EXPENDITURES.

New Southern Entrance.....	\$5,897.52	
Asphalt walks.....	8,111.41	
Stone steps.....	990.80	
	<u>\$14,999.73</u>	
Balance merged.....	.27	
		<u>\$15,000.00</u>

C. S. W. PACKARD,
Treasurer.

Audited and found correct, April 24th, 1917.
STOCKTON, BATES & SONS.

SUPERINTENDENT'S REPORT.

To the Board of Directors of the Zoological Society of Philadelphia:—

GENTLEMEN:—I beg to submit my report for the year ending February 28th, 1917.

Total number of animals exhibited in each class during the year:—

MAMMALS.....	596
BIRDS.....	1,292
REPTILES.....	671
AMPHIBIANS.....	22
	<hr/>
	2,581

The species exhibited in the collection for the first time were:—

Patagonian Cavy (*Dolichotis patachonica* Shaw).

Habitat, Patagonia into Argentina.

A fine pair of these harelike rodents, the only existing species of the genus, was purchased on June 3d.

Common Duiker or Bush Buck (*Cephalophus grimmi* Linnæus).

Hab., South Africa.

A female imported by the Society direct from Africa was received on February 10th.

Columbian Black-tailed Deer (*Mazama columbiana* Richardson).

Hab., Western North America from British Columbia to California west of the Cascade Mountains.

A young pair was received by purchase on April 13th.

Lund's Opossum (*Didelphys albiventris*).

Hab., Brazil.

An adult pair and four young ones of this rare and but recently described species were purchased on November 21st.

Mexican Crested Hangnest (*Cassiculus melanicterus* Bonaparte).

Hab., Western Mexico.

Three males by purchase on February 14th.

Greater Bird of Paradise (*Paradisea apoda* Linnæus).

Hab., Aru Islands.

An immature male of this splendid species was received by purchase on May 10th.

Brazilian Troupial (*Icterus jamaicai* Gmelin).

Hab., S. E. Brazil.

Two were purchased on August 26th.

Black-winged Troupial (*Icterus xanthornus* Gmelin).

Hab., Northern South America.

A pair purchased on October 11th.

Yellow-fronted Tanager (*Euphonia luteicapilla* Cabanis).

Hab., Southern Central America.

Two by purchase on October 11th.

Cayenne Tanager (*Calliste cayana* Linnæus).

Hab., Northern South America.

One purchased November 21st.

Brazilian Scarlet Tanager (*Rhamphocælus brazilius* Desmarest).

Hab., Southeast Brazil.

One male and two females purchased November 21st.

Ashy-breasted Tanager (*Saltator olivascens* Cabanis).

Hab., Northern South America.

Two by purchase on November 21st.

Brown-capped Tanager (*Schistochlamys capistratus* Reichenbach).

Hab., Southeastern Brazil.

Two by purchase on November 21st.

Rainbow Bunting (*Passerina leclancheri* Lafresnaye).

Hab., Western Mexico.

One male was received by purchase on June 30th.

Brazilian Blue Grosbeak (*Guiraca cyanea* Linnæus).

Hab., Brazil.

A pair was purchased on November 21st.

Black-headed Siskin (*Chrysomitris notata* DuBus).

Hab., Mexico to Guatemala.

One male and two females were purchased on October 10th.

Dusky Solitaire (*Myiadectes obscurus* Lafresnaye).

Hab., Mexico.

One male purchased on February 16th.

Three-colored Woodpecker (*Melanerpes tricolor* Wagler.)

Hab., Colombia and Venezuela.

A pair by purchase on October 11th.

Blue-orbited Passerine Parrakeet (*Psittacula conspicillata* Lafresnaye.)

Hab., Colombia and E. Ecuador.

Six of these very rare dwarf parrots were purchased on August 12th.

Bateleur Eagle (*Helotarsus ecaudatus* Daudin).

Hab., Africa.

One specimen in immature plumage was imported by the Society from South Africa on February 10th.

European Goshawk (*Astur palumbarius* Lafresnaye).

Hab., Europe generally and in winter into Africa and India.

A single specimen was received by presentation on June 17th.

Greater Kestrel (*Cerchneis rupicoloides* Smith.)

Hab., South Africa.

Crested Francolin (*Francolinus sephaena* Newton).

Hab., South Africa.

Emerald Spotted Dove (*Chalcopelia chalcospilos* Wagler).

Hab., Central and South Africa.

A single specimen of each of the above three species was received by direct importation by the Society from South Africa on February 10th.

Goliath Heron (*Ardea goliath* Cretzschm).

Hab., Africa.

Two by purchase were received on May 30th.

Bell's Hinge-backed Tortoise (*Cinixys belliana* Gray).

Hab., Tropical Africa.

Two were imported by the Society from South Africa on February 10th.

Chuckawalla (*Sauromalus ater* Dumeril).

Hab., Desert regions of Southwestern United States.

A single specimen of this rare lizard was purchased on September 24th.

Among other arrivals the following may be mentioned as of special interest:—

Two Chimpanzees, an exceptionally fine male, was purchased on April 7th, and a mature female was presented by Dr. William H. Furness 3d, Wallingford, Pa., on May 24th.

One White-tailed Gnu, a female, was received by purchase on June 15th.

A collection of birds, consisting of two Golden-crowned Conures, one Hawk-headed Parrot, one Yellow-thighed Parrot, one Dusky Parrot, two Crested Curassows, four Razor-billed Curassows, one Lesser Rufous-vented Guan, one Night Heron, four Scarlet Ibis and five finches, all collected in Brazil by Dr. William C. Farabee, for the University of Pennsylvania Museum and presented to the Society by that institution on June 20th.

Two Raccoon-like Dogs, both females, were presented by the New York Zoological Society on July 26th.

One Wolverine, an unusually good specimen, was purchased on August 10th.

One Salle's Amazon, a good specimen of this rather rare parrot, was collected by Dr. William L. Abbott in San Domingo and presented by him to the Society on November 3d.

One Naked-throated Bell Bird in immature plumage was purchased on November 11th.

Two Tasmanian Devils, a fine male and female, were purchased on November 14th.

One Raccoon-like Dog, a male, was deposited by the New York Zoological Society on November 17th.

One Eyra, a fine male of this rare species of Felidæ, was purchased on November 22d.

A pair of Great Kangaroos, a male and two female Robust Kangaroos and two Wedge-tailed Eagles, were purchased on November 27th.

Two Ring-tailed Coatis, presented by William C. Wilson on November 27th.

Eight African Puff Adders and six Hoary Snakes were added to the collection by direct importation from South Africa on December 5th.

Two Squirrel-like Phalangers were received by presentation from the New York Zoological Society on January 6th.

Two Entellus or Sacred Monkeys, an adult male and female in remarkably good condition, were added to the collection by purchase on January 18th.

Two Springboks, male and female, one Secretary Vulture, one Crested Francolin, eight Pigeons and Doves of four species, two White-crested Touracous, two Helmeted Guinea-Fowl, one Red-billed Hornbill and nine Tortoises were received by direct importation from South Africa on February 10th.

Fifteen Finches of seven distinct species were also received by direct importation from South Africa on February 16th.

One Goshawk, presented by Dr. William Pepper on February 23d.

The following animals were born in the Garden during the year:—

2 rhesus macaques (*Macacus rhesus*), ♂ and ♀, May 11th and April 26th.

2 common marmosets (*Callithrix jacchus*), April 9th.

- 1 ring-tailed lemur (*Lemur catta*), ♀, March 23d.
- 1 mongoose lemur (*L. mongoz*), ♀, March 22d.
- 3 lions (*Felis leo*), 2 ♂s and ♀, May 13th.
- 2 pumas (*F. concolor*), September 28th and February 18th.
- 7 American gray wolves (*Canis mexicanus*), 5 ♂s and 2 ♀s, March 31st.
- 2 grizzly bears (*Ursus horribilis*), January 3d.
- 3 Kamchatkan brown bears (*U. beringiana*), 1 on January 11th and 2 on January 12th.
- 8 coypus (*Myocastor coypus*), 4 on April 6th and 4 on October 27th.
- 1 agouti (*Dasyprocta* (?)), October 21st.
- 1 Prjevalsky's horse (*Equus prjevalskii*), ♀, July 5th.
- 1 American bison (*Bison bison*), ♀, July 30th.
- 1 yak (*Pæphagus grunniens*), ♂, June 24th.
- 1 Indian antelope (*Antilope cervicapra*), ♀, November 5th.
- 2 Himalayan tahr (*Hemitragus jemlaicus*), ♂ and ♀, August 11th and June 8th.
- 2 aoudads (*Ovis tragelophus*), ♂ and ♀, April 3d.
- 4 red deer (*Cervus elaphus*), ♂s, June 12th, July 13th, and ♀s, May 31st, June 5th.
- 2 fallow deer (*C. dama*), ♂ and ♀, July 3d and June 11th.
- 1 hog deer (*C. porcinus*), ♂, March 14th.
- 2 Barasingha deer (*C. duvauceli*), ♂ and ♀, February 27th and July 15th.
- 4 Japanese sika deer (*C. sika*), ♂ July 10th and ♀s, May 7th, June 7th and June 19th.
- 1 Manchurian sika deer (*C. s. manchuricus*), ♀, July 11th.
- 1 Bactrian camel (*Camelus bactrianus*), ♀, April 27th.
- 3 llamas (*Lama glama*), 3 ♀s, August 3d, January 20th and February 18th.
- 5 northern wart hogs (*Macrocephalus africanus*), 3 ♂s and 2 ♀s, May 28th.
- 3 rufous rat kangaroos (*Epyprymnus rufescens*), ♂, February 28th, and ♀s, June 14th and September 22d.

- 10 silver pheasants (*Gemnæus nycthemerus*), May 14th and July 1st.
- 8 golden pheasants (*Chrysolophus pictus*), June 27th.
- 10 eastern wild turkeys (*Meleagris gallopavo*), May 30th and June 3d.
- 3 lesser black-backed gulls (*Larus fuscus*), June 19th.
- 3 herring gulls (*L. argentatus smithsonianus*), June 2d.
- 3 Canada geese (*Branta canadensis*), June 8th.
- 1 East Indian black duck (*Anas boschas*), domestic variety, July 12th.
- 9 red-headed ducks (*Fuligula ferina americana*), July 20th.
- 27 red-sided garter snakes (*Thamnophis sirtalis parietalis*), August 24th.
- 3 water moccasins (*Ancistrodon piscivorus*), October 5th.

LIST OF ADDITIONS TO THE MENAGERIE FOR THE YEAR ENDING
FEBRUARY 28TH, 1917.

- 1916.
- Mar. 3. 1 yellow-fronted amazon presented by G. W. Hilsee, Philadelphia.
10. 2 alligators presented by Mrs. W. H. Shugard, Bala, Pa.
11. 1 white-nosed coati (♀) presented by C. E. Brewster, Pennsylvania Game Commission.
14. 1 hog deer (♂) born in the Garden.
16. 1 Levallant's amazon presented by Mrs. Charles Weiler, Philadelphia.
2 ocelots (♂ ♀) purchased.
18. 1 white tailed deer (♂) presented by Frank Ingle, Colonia, State of Tamaulipas, Mexico.
22. 1 mongoose lemur (♀) born in the Garden.
23. 1 ring-tailed lemur (♀) born in the Garden.
24. 1 starling captured in the Garden.
25. 1 alligator presented by Morgan S. Reichner, Philadelphia.
3 western diamond rattlesnakes, 3 Emory's snakes, 2 Say's pine snakes and 5 whip snakes purchased.
- April 30. 1 black-handed spider monkey purchased.
31. 7 gray wolves (♂ ♂ ♂ ♂ ♂ ♀ ♀) born in the Garden.
3. 2 aoudads (♂ ♀) born in the Garden.
4. 1 moustached monkey (♂), 1 red monkey (♀) and 3 Brazilian tortoises purchased.
5. 1 eastern diamond rattlesnake purchased.
6. 4 coypus born in the Garden.
1 kinkajou (♂) presented by L. Kirwin, Collingswood, N. J.
7. 1 chimpanzee (♂) purchased.
2 common marmosets born in the Garden.
11. 8 American green lizards presented by John L. Gefroer, Philadelphia.
12. 2 white-faced tree ducks (♂ ♀), 2 rosy-billed ducks (♂ ♀), 2 paradise cranes (♂ ♀) purchased.
1 Muhlenberg's terrapin presented by William Beisel, Philadelphia.
13. 2 Colombian black-tailed deer (♂ ♀) purchased.
14. 1 Malayan sambur deer (♂) purchased.
3 ground rattlesnakes, 2 water moccasins, 4 harlequin snakes, 4 hog-nosed snakes, 4 king snakes, 3 chicken snakes, 5 black snakes, 1 whip snake, 2 brown water snakes, 2 banded water snakes, 2 common garter snakes and 1 keeled green snake purchased.
20. 2 eastern wild turkeys (♀ ♀) purchased.
22. 2 Indian bar-headed geese purchased.
1 Levallant's amazon presented by Mrs. C. Kaeser, Philadelphia.
24. 1 Amherst pheasant (♂) and 2 southern fox squirrels (♂ ♀) presented by Mrs. Norton Downs, Three Tuns, Pa.
1 white-fronted amazon presented by Mrs. S. D. Hugg, Camden, N. J.
26. 1 rhesus macaque born in the Garden.
2 ring-tailed bassaris (♂ ♀), 1 nine-banded armadillo (♀), 1 western diamond rattlesnake, 4 Holbrook's water snakes, 4 whip snakes, 4 Lindheimer's snakes, 7 common horned lizards, 1 spiny-comb lizard and 1 common iguana purchased.
1 opossum (♂) presented by W. J. Windsor, Philadelphia.
27. 1 Bactrian camel (♀) born in the Garden.
28. 2 pairs summer ducks, 2 pairs mandarin ducks, 2 pairs pintail ducks, 2 pairs mallards and 1 pair East Indian black ducks purchased.
- May 1. 1 Levallant's amazon presented by Mrs. Charles B. Reed, Philadelphia.
2. 3 pairs green-winged teal purchased.
3. 3 pairs pin-tailed ducks purchased.
1 raccoon (♀) presented by John D. McIlhenny, Germantown, Philadelphia.
4. 1 bald eagle presented by Miss Eickert, Philadelphia.
7. 1 Japanese sika deer (♀) born in the Garden.
9. 1 white-fronted amazon presented by Mrs. C. H. Pearson, Philadelphia.
10. 1 greater bird of paradise, 2 red and yellow macaws, 1 blue and yellow macaw and 1 sulphur-crested cockatoo purchased.
11. 1 rhesus macaque (♂) born in the Garden.
13. 2 emus, 3 rheas and 1 Australian cassowary purchased.
3 lions (♂ ♂ ♀) born in the Garden.
4 turtle doves presented by Walter Busch, Philadelphia.
14. 4 silver pheasants born in the Garden.
1 DeKay's snake, 2 common garter snakes and 2 common water snakes presented by Charles E. Ritter, Philadelphia.
19. 1 great horned owl presented by Mrs. E. Halse, Marlton, N. J.
1 whip snake, 4 hog-nosed snakes, 4 red-skinned garter snakes, 1 Marcy's garter snake, 4 Holbrook's water snakes and 4 yellow-bellied black snakes purchased.
20. 2 darters purchased.
1 alligator presented by Rev. Joseph L. N. Wolfe, Philadelphia.

- May 21. 3 American green lizards presented by Kenneth Wilson, Philadelphia.
 1 bull frog presented by Charles E. Ritter, Philadelphia.
 24. 1 chimpanzee (♀) presented by Dr. William H. Furness, 3d, Wallingford, Pa.
 2 bullfrogs presented by William Beisel, Philadelphia.
 27. 1 Bengal tiger (♀) purchased.
 28. 5 northern wart hogs (♂ ♂ ♂ ♀ ♀) born in the Garden.
 1 great horned owl presented by John Colio, Altoona, Pa.
 30. 2 North African jackals (♂ ♀), 1 Himalayan bear (♂) and 2 goliath herons purchased.
 4 wild turkeys born in the Garden.
 31. 1 pine snake purchased.
 1 red deer (♀) born in the Garden.
- June 1. 1 green monkey (♀), 1 sooty mangabey (♂), 1 Cape hyrax (♀) and 2 blossom-headed parakeets purchased.
 2. 1 bald eagle presented by D. M. Lewis, Merchand, Pa.
 3 herring gulls born in the Garden.
 3. 2 Patagonian caviés (♂ ♀) purchased.
 3. 6 wild turkeys born in the Garden.
 4. 1 DeKay's snake presented by Alfred R. Allen, Jr., Philadelphia.
 2 Muhlenberg's terrapins presented by Roy Applegate, Philadelphia.
 5. 1 red deer (♀) born in the Garden.
 7. 1 Japanese sika deer (♀) born in the Garden.
 2 alligators presented by Dr. J. L. Tadd, Philadelphia.
 8. 1 Himalayan tahr and 3 Canada geese born in the Garden.
 9. 1 alligator presented by George H. Bender, Philadelphia.
 10. 2 eastern diamond rattlesnakes, 2 water moccasins, 2 long-nosed sand snakes, 1 whip snake and 2 hog-nosed snakes purchased.
 2 gulls born in the Garden.
 11. 3 alligators presented by Godfrey Zentmayer, Philadelphia.
 1 fallow deer (♀) born in the Garden.
 12. 1 red deer (♂) born in the Garden.
 13. 1 yellow-shouldered amazon presented by Mrs. E. C. Downing, Philadelphia.
 1 alligator presented by Dr. C. S. Miller, Philadelphia
 14. 1 rufous rat kangaroo born in the Garden.
 1 slender-billed cockatoo purchased.
 15. 1 white-tailed gnu (♀) purchased.
 16. 7 prairie dogs, 1 Le Conte's snake, 1 western sand snake, 2 Marcy's garter snakes and 1 Graham's water snake purchased.
 17. 1 Virginia deer (♀) purchased.
 1 European goshawk presented by Benjamin R. Hoffman, Philadelphia.
 1 great green macaw presented by Dr. J. H. Muller, Secane, Pa.
 18. 1 great weaver (♂) presented by Charles J. Bender, Merion, Pa.
 19. 1 Japanese sika deer (♀) and 3 black-backed gulls born in the Garden.
 1 banded rattlesnake, 1 copperhead snake and 2 common water snakes presented by H. E. Knowlton, Haverford, Pa.
 20. 2 golden-crowned cunures, 1 hawk-headed parrot, 1 yellow-thighed parrot, 2 crested curassows, 4 razor-billed curassows, 1 lesser rufous-vented guan, 1 night heron, 4 scarlet ibis, 1 dusky parrot and 5 finches presented by the University of Pennsylvania Museum.
 1 flying squirrel presented by Dr. G. J. Schwartz, Philadelphia.
 4 water moccasins and 1 pine snake purchased.
 21. 8 mallard ducks presented by Graham Spencer, Devon, Pa.
 22. 1 yellow hangnest purchased.
 1 alligator presented by John A. Morris, Philadelphia.
 23. 14 mallard ducks purchased.
 24. 1 yak (♂) born in the Garden.
 26. 1 alligator presented by W. H. Dilks, Jr., Chestnut Hill, Philadelphia.
 27. 8 golden pheasants born in the Garden
 3 alligators presented by Master Charles S. Taylor, Jr., Wayne, Pa.
 28. 1 great horned owl presented by W. R. Allen, Philadelphia.
 1 alligator presented by Mrs. J. H. Charles, Wenonah, N. J.
 29. 1 white-nosed coati (♀) presented by Mrs. A. Walton, Philadelphia.
 30. 2 Yucatan jays, 1 black-throated troupial, 2 Mexican house finches, 2 black-headed grosbeaks, 2 Mexican siskins and 1 rainbow bunting purchased.
 1 alligator presented by Miss Martha McAllister, Chestnut Hill, Philadelphia.
- July 1. 6 silver pheasants born in the Garden.
 3. 1 fallow deer (♂) born in the Garden.
 4. 1 pair many-colored parakeets and 1 pair Baur's parakeets purchased.
 1 prairie dog presented by W. Stokes Kirk, Philadelphia.
 1 peacock presented by Morris Sclarenco, Philadelphia.
 3 Blainville's horned lizards presented by Calvin T. Boggs, Jr., Philadelphia.
 1 common box tortoise presented by Miss Carrie Waters, Philadelphia.
 5. 1 Prjevalsky's horse (♀) born in the Garden.
 1 copperhead snake and 1 striated terrapin presented by James C. Furst, Bellefonte, Pa.
 4 common garter snakes born in the Garden.
 6. 3 raccoons presented by Louis H. Eisenlohr, Philadelphia.
 1 hog-nosed snake presented by John L. Gefrorer, Philadelphia.

- July 7. 1 king snake presented by Charles S. Hurlock, Wilmington, Del.
8. 1 alligator presented by S. H. Hunsicker, Norristown, Pa.
10. 1 Japanese sika deer (♂) born in the Garden.
11. 1 Manchurian sika deer (♀) born in the Garden.
12. 1 East Indian black duck born in the Garden.
13. 1 pine snake presented by Roy Stanley Humbert, Lansdowne, Pa.
14. 1 red deer (♂) born in the Garden.
15. 2 laughing jackasses purchased.
16. 1 Barasingha deer (♀) born in the Garden.
17. 1 woodchuck presented by Roy Kaerther, Colwyn, Pa.
18. 1 alligator presented by H. J. Law, Philadelphia.
19. 1 great horned owl presented by Fred Jaunsen, Philadelphia.
20. 1 horned lizard presented by Mrs. W. M. Blackburne, Philadelphia.
21. 2 alligators presented by George R. Packard, Jr., Villa Nova, Pa.
22. 1 alligator presented by Joseph Weber, Philadelphia.
23. 9 red-headed ducks born in the Garden.
24. 1 alligator presented by Miss Barbara Adams, Philadelphia.
25. 1 garter snake and 1 milk snake presented by Master and Miss Tinsman, West Chester, Pa.
26. 2 raccoon-like dogs (♀ ♀) presented by the New York Zoological Society.
27. 1 copperhead snake presented by Mrs. W. Anderson, Philadelphia.
28. 1 pine snake presented by Paul Meister, Philadelphia.
29. 7 little green herons presented by H. J. Yoder, Harper, Kansas.
30. 3 banded rattlesnakes, 1 red-skinned garter snake, 2 whip snakes, 2 milk snakes, 1 western sand snake, 7 collared lizards and 1 horned lizard purchased.
- Aug. 31. 1 American bison (♀) born in the Garden.
1. 1 alligator presented by Messrs. Gillinder & Sons, Tacony, Philadelphia.
2. 6 passerine parakeets purchased.
3. 1 European goldfinch presented by Ed. H. Morris, Philadelphia.
4. 2 giant toads presented by William Beisel, Philadelphia.
5. 1 llama (♀) born in the Garden.
6. 1 vulpine phalanger and 4 Surinam ameiva lizards purchased.
7. 2 banded rattlesnakes purchased.
8. 1 woodchuck presented by Captain E. S. Leiper, Philadelphia.
9. 1 barn owl presented by Miss Mabel May, Philadelphia.
10. 1 banded rattlesnake purchased.
11. 1 wolverine (♀) purchased.
12. 1 Himalayan tahr (♂) born in the Garden.
13. 1 gray squirrel presented by George Swisher, Philadelphia.
14. 1 common skunk presented by Charles Saber, Philadelphia.
15. 1 yellow-cheeked amazon presented by Mrs. A. C. Perring, Philadelphia.
16. 6 blue-orbited passerine parakeets, 2 blue-bearded jays, 1 cactus conure, 4 common iguanas and 1 brown cebus (♂) purchased.
17. 2 alligators presented by Miss Bessie Hauck, Philadelphia.
18. 1 yellow hangnest and 1 red-backed hangnest purchased.
19. 1 canary bird presented by Mrs. F. Rumber, Philadelphia.
20. 2 alligators presented by William Hambrecht, Jr., Philadelphia.
21. 1 horned lizard presented by Miss Bertha Finkenauer, Philadelphia.
22. 1 sun bear (♀) and 2 Florida gallinules purchased.
23. 1 skunk (♀) presented by T. R. Wilson, Reading, Pa.
24. 1 Levaillant's amazon presented by Herman Yorke, Philadelphia.
25. 27 red-skinned garter snakes born in the Garden.
26. 1 orange-winged amazon presented by Mrs. B. Dunham, Philadelphia.
27. 2 silky cowbirds, 3 red-crested cardinals, 2 Brazilian troupials, 1 blue-bearded jay, 3 Derby's tyrans, 20 undulated grass parakeets, 4 chestnut breasted finches, 10 Amadavine finches, 4 chestnut-eared finches, 2 Muscovy ducks and 3 banded rattlesnakes purchased.
28. 1 alligator presented by Miss Julia H. Wirth, Riegelsville, Pa.
29. 3 great weavers and 2 red-shouldered parakeets purchased.
- Sept. 30. 1 woodchuck (♂) presented by Charles Lindsay, Jr., Philadelphia.
1. 2 Harlan's iguanas purchased.
2. 1 common horned lizard presented by Wells, Fargo Express Co., Philadelphia.
3. 1 screech owl presented by Eldridge R. J. Hood, Philadelphia.
4. 1 common horned lizard, 2 least horned lizards presented by Dosmat Grillet, Philadelphia.
5. 1 alligator presented by Andrew I. Woodlyn, Philadelphia.
6. 1 rufous rat kangaroo born in the Garden.
7. 2 common horned lizards presented by Ralph Green, Philadelphia.
8. 1 keeled green snake presented by David McCadden, Philadelphia.
9. 1 alligator presented by Frank Johnson, Philadelphia.
10. 1 chuckawalla purchased.
11. 5 tigrine salamanders presented by Roy S. Humbert, Philadelphia.
12. 1 American wild cat (♂) presented by H. A. Walters, University of Pennsylvania.
13. 1 puma born in the Garden.
14. 1 white-nosed coati (♂) presented by Fred Johnson, Philadelphia.
15. 1 spotted salamander presented by William C. Richardson, St. James School, Washington County, Md.

- Oct. 5. 3 water moccasins born in the Garden.
 1 common horned lizard presented by Miss Marjorie Mason, Philadelphia.
 6. 1 common starling presented by John Maroney, Philadelphia.
 10. 1 palm tanager and 1 saffron finch presented by Henry Bartels, New York.
 1 red-winged thrush, 6 black-headed finches, 6 spotted munia finches, 2 Mexican finches, 4 dark-backed pigeons, 4 Australian crested pigeons, 1 gray clarin, 10 Anadavine finches, 8 melodious finches, 4 Java sparrows, 2 Mexican siskins, 1 Mexican goldfinch and 10 mountain blacksnakes purchased.
 1 herring gull presented by B. H. Wilbur, Rosemont, Pa.
 11. 2 white-crowned pigeons, 3 saffron finches, 2 South American rice grackles, 4 silver-blue tanagers, 2 black-winged tropicuals, 2 yellow-fronted tanagers, 2 three-colored woodpeckers purchased.
 17 purple grackles, 1 American robin and 1 song sparrow caught in the Garden.
 1 yellow-bellied black snake, 1 elegant bull snake, 3 red-skinned water snakes, 1 hog-nosed snake, 1 Western sand snake, 5 Holbrook's water snakes 1 whip snake, 1 Say's pine snake and 3 collared lizards purchased.
 1 alligator and 2 painted terrapins presented by Mrs. R. McCaw, Philadelphia.
 1 alligator presented by Melvin Straub, Philadelphia.
 14. 1 alligator presented by John Campbell, Philadelphia.
 1 common horned lizard presented by William Myer, Philadelphia.
 15. 1 chewink (♂) caught in the Garden.
 16. 1 Say's pine snake and 2 common horned lizards presented by Andrew Hicks, Philadelphia.
 17. 1 ground rattlesnake, 2 Eastern diamond rattlesnakes, 2 water moccasins, 6 harlequin snakes, 1 black snake, 4 chicken snakes, 1 corn snake, 5 common garter snakes, 3 king snakes, 1 red-bellied snake, 6 whip snakes and 2 brown water snakes purchased.
 18. 1 song sparrow caught in the Garden.
 2 Gila monsters presented by Miss May S. Lightkep, Philadelphia.
 19. 1 fish hawk presented by The United Fruit Company, Philadelphia.
 20. 1 brown thrush and 1 song sparrow caught in the Garden.
 21. 1 alligator presented by J. E. Highley, Philadelphia.
 1 agouti born in the Garden.
 23. 2 painted terrapins presented by Harry Schneider, Philadelphia.
 1 common starling and 2 hermit thrushes caught in the Garden.
 24. 1 wave-lined lizard and 1 painted terrapin presented by Samuel Scoville, Jr., Philadelphia.
 25. 1 Say's rattlesnake presented by William Edward Straw, Philadelphia.
 26. 6 purple grackles caught in the Garden.
 27. 4 coypus born in the Garden.
 1 common horned lizard presented by Mrs. Emily Rust, Philadelphia.
 28. 1 weeper cebus (♂) presented by H. C. Beagary, Philadelphia.
 30. 1 alligator presented by D. L. Enne, Camden, N. J.
 Nov. 3. 1 Salle's amazon presented by Dr. William L. Abbott, Philadelphia.
 4. 3 mealy redpolls, 3 common linnets and 4 greater titmice purchased.
 1 tigrine salamander presented by William Kinnes, Philadelphia.
 5. 1 Indian antelope (♀) born in the Garden.
 6. 1 menobranchus presented by James L. Rivell, Paulsboro, N. J.
 7. 1 great horned owl presented by Mrs. J. Robert Shawkey, Philadelphia.
 8. 1 common horned lizard presented by B. F. Jorden, Philadelphia.
 9. 1 short-tailed parrot and 2 Cayenne rail purchased.
 11. 1 sooty mangabey (♀), 1 grivet monkey (♂), 2 crested pigeons and 1 parakeet (*Platyercus* ?), immature, purchased.
 1 keeled green snake presented by T. C. Loder, Cynwyd, Pa.
 12. 1 green monkey (♂) and 1 naked-throated bell bird purchased.
 13. 2 water moccasins, 3 king snakes, 1 banded water snake, 1 red-bellied snake, 3 black snakes, 1 corn snake, 4 hog-nosed snakes, 3 Sacken's garter snakes, 2 scarlet king snakes, 2 keeled green snakes and 3 ground rattlesnakes purchased.
 1 prairie wolf presented by John Sinnott, Philadelphia.
 14. 2 Tasmanian devils (♂ ♀) purchased.
 16. 1 alligator presented by M. L. Wilson, Wallingford, Pa.
 1 common horned lizard presented by Charles McFadden, 3d, Philadelphia.
 17. 1 raccoon-like dog (♂) deposited by the New York Zoological Society.
 18. 1 common opossum presented by George M. Hoffman, Philadelphia.
 1 alligator presented by Miss Barbara Clayton, Haverford, Pa.
 21. 6 Lund's opossums (♂ and ♀ with 4 young in pouch), 4 red-headed cardinals, 3 Brazilian scarlet tanagers (♂ ♀ ♀), 1 Cayenne rail, 2 purple gallinules, 4 scaly ground doves, 2 brown-capped tanagers, 2 Brazilian blue grosbeaks, 1 Cayenne tanager, 2 ashy-breasted tanagers and 2 variegated teguixins purchased.
 22. 1 eyra (♂) purchased.
 2 tree frogs presented by William Beisel, Philadelphia.
 23. 1 mute swan, 2 Chinese geese, 1 European sheldrake, 1 pin-tailed duck and 1 mandarin duck presented by Walter E. Hering, Philadelphia.
 24. 1 white opossum presented by P. W. Riefaber, Philadelphia.
 1 orange-winged amazon presented by John B. Kreider, Philadelphia.

- Nov. 25. 1 eastern diamond rattlesnake purchased.
 2 alligators presented by Miss Edna M. Rutter, Philadelphia.
 1 alligator presented by Miss Clemantine Middendorf, Philadelphia.
27. 2 great gray kangaroos (♂ ♀), 3 robust kangaroos (♂ ♀ ♀), 1 black-backed piping crow, 2 wedge-tailed eagles and 2 black swans purchased.
 2 ring-tailed coatis presented by William C. Wilson, Philadelphia.
- Dec. 1. 1 Canada porcupine presented by A. L. Wolcott, Philadelphia.
 3. 1 painted terrapin presented by Karl W. Schneyder, Jr., Philadelphia.
 5. 8 African puff adders and 6 hoary snakes collected in South Africa for the Society.
 6. 3 painted terrapins presented by William Beisel, Philadelphia.
 9. 12 Texas quail and 12 scaled quail purchased.
 13. 7 alligators presented by A. J. Drexel Biddle, Philadelphia.
 21. 1 gray fox (♂) presented by Edwin F. Henson & Co., Philadelphia.
 23. 6 Indian silver-bill finches purchased.
 27. 2 Gray's thrushes, 2 Columbian grackles and 10 meadow larks purchased.
 28. 6 Amadavine finches purchased.
 29. 4 canary birds presented by Morris Lewis Stovell, Haverford, Pa.
 30. 1 horned lizard presented by William Kinnes, Philadelphia.
- 1917.
- Jan. 2. 6 diamond-backed terrapins (♀s) purchased.
 6 diamond-backed terrapins (♂s) presented by A. M. Barbee, Isle of Hope, Georgia.
 1 yellow-fronted amazon presented by J. Walter Keller, Philadelphia.
 3. 2 grizzly bears born in the Garden.
 5. 3 bald eagles and 4 American egrets purchased.
 6. 2 squirrel-like phalangers (♂ ♂) presented by the Zoological Society of New York.
 1 American green lizard presented by Walter A. Hinkle, Philadelphia.
 7. 1 Barbary ape (♀), 1 mongoose lemur (♀) and 1 goshawk purchased.
 9. 1 European blackbird, 2 song thrushes, 6 skylarks, 2 goldfinches, 3 common linnets, 2 green finches, 1 yellow-ammer, 3 bulfinches and 2 chaffinches purchased.
 11. 1 Kamchatkan bear born in the Garden.
 12. 2 Kamchatkan bears born in the Garden.
 13. 1 Texas quail presented by C. B. McLean, *The Evening Bulletin*, Philadelphia.
 18. 2 Entellus monkeys (♂ ♀) purchased.
 1 rufous rat kangaroo born in the Garden.
 19. 1 starling presented by Miss C. S. Nock, Philadelphia.
 20. 1 llama (♀) born in the Garden.
 21. 1 opossum (♂) presented by John D. O'Connell, Philadelphia.
 23. 1 opossum (♀) presented by H. J. Miller, Bala, Pa.
 1 red-tailed hawk presented by Paul E. Schafer, Philadelphia.
25. 1 Virginia Deer (♂) presented by Col. H. C. Trexler, Allentown, Pa.
- Feb. 8. 1 alligator presented by Michael Meehan, Philadelphia.
 10. 2 springboks (♂ ♀), 1 common duiker (♀), 1 secretary vulture, 1 bateleur eagle, 1 greater kestrel, 1 crested francolin, 1 Natal francolin, 2 Cape doves, 3 Senegal turtle doves, 2 white crested touracous, 2 helmeted guinea fowl, 1 emerald spotted dove, 1 red-billed hornbill, 2 dark-backed pigeons, 2 leopard tortoises and 2 Bell's hinge-backed tortoises collected in South Africa for the Society.
 14. 3 Mexican crested hangeests and 4 melodious finches purchased.
 16. 2 blue-bellied finches, 2 violet-eared waxbills, 2 St. Helena finches, 3 cutthroat finches, 3 red-beaked weavers, 1 Angolan finch and 2 regal whydah birds collected in South Africa for the Society.
 2 black-tailed hawfinches and 1 dusky solitaire purchased.
 17. 1 pied-billed grebe presented by H. Severn Regar, Norristown, Pa.
 18. 1 puma and 1 llama (♀) born in the Garden.
 23. 1 goshawk presented by Dr. William Pepper, Philadelphia.
 24. 1 alligator presented by J. C. Wilson, Philadelphia.
 27. 1 Barasingha deer (♂) born in the Garden.
 28. 1 rufous rat kangaroo (♂) born in the Garden.

REPORT OF THE LABORATORY OF COMPARATIVE
PATHOLOGY FOR THE YEAR ENDING FEBRUARY
28TH, 1917.

The losses of the Garden during the year, as represented by the autopsies, have been 339, which is fewer than for three years but nevertheless serious in including some very valuable specimens, important enough to receive special description. A glance at the appended list of deaths and diagnoses will reveal the large percentage mortality among Aves while fewer Carnivora are included. There were, however, no epizootics as occurred in the past two years.

The most unfortunate and conspicuous loss of the year was the giraffe, which succumbed on February 16th to an acute fermentative gastritis. While this was the acute and determining cause of death the animal showed a serious infestation of the biliary passages with uncinarial worms, the parasites causing a form of cirrhosis and tumor-like growths in the bile ducts. She had in addition an acute bronchitis.

A less serious but yet important loss was that of the chimpanzee "Congo." On January 2d the animal was seen to be dyspneic and was found to have a temperature of 103°F. Further inspection revealed playing of the alae of the nose and a heavy grunting respiration. Physical examination was not considered practicable, so a tentative diagnosis of pneumonia was made and appropriate treatment, consisting of warm moist air impregnated with Turlington's balsam and oxygen inhalations, was instituted. Some improvement seemed to occur but the animal later failed and died on the third day. Autopsy revealed a broncho-pneumonia due to the influenza bacillus and a pneumococcus of IV type. The body also presented an acute enteritis, and an appendicitis comparable to the acute form seen in human beings. No tuberculosis existed.

The death of the Hainan Gibbon resulted from a curious accident. This animal always wore a loose belt, an appliance necessary in holding him, and apparently without the slightest irritation or discomfort of any kind. Early in the morning of January 2d he was noticed to be bleeding from the region of the waist and his belt was removed, whereupon blood spurted from an abraded area in the right loin; death occurred (in a short time) apparently from the hemorrhage since no other sufficient cause was found elsewhere in the body.

The white-crowned monkey, the very rare specimen we have had for four years, died from a toxemia in all probability dependent upon a chronic gastritis. The loss of the Phillipine spotted deer was due to tuberculosis of the lungs with cavitation, a rather unusual finding in deer.

The Stanley crane died as a result of a toxemia seemingly due to some occult intestinal poisoning. It unfortunately could not be fastened upon any article of diet; no other bird from this same enclosure died near the same time so that it did not look like food poisoning.

A lioness was killed because of its failing condition, a sacrifice warranted by finding a chronic gastro-enteritis of a character from which no recovery was at all likely.

Four bears have died—grizzly, sloth, polar, and Tibetan blue. The first was a very old specimen, in the collection twenty-six years and becoming so infirm that his end was hastened. He showed a gastro-enteritis and the fibrosis of age. The sloth bear died from an enteritis and hemorrhages in the stomach from recent erosions; he also had a recent naso-pharyngitis. The polar bear died from a complication of conditions, among which multiple tumors arising from the adrenal bodies and trichinæ in the diaphragm were the most important. These worms will receive some comment by Dr. Weidman. The important Tibetan blue bear died of a choleriform enteritis and a hemorrhage in the thyroid gland.

There was described in the 1916 report an apparently infectious or toxic epizootic among the waterfowl on the

lake. As noted then the last case for the fiscal year occurred early in January. During the past fiscal year five scattered sporadic deaths have occurred, the birds showing the same indefinite changes discovered in 1915. It appears, then, that no epizootic has occurred but that the virus, whatever it may be, remained among the birds or in their enclosure, although it must have been reduced in vigor. The lesions in these birds again indicate that the poison attacks the muscles and not the central nervous system as in poliomyelitis. The cleaning of the pond while not effecting a complete disappearance of the disease was followed by a great reduction in cases; so far and no farther dare we go.

A large number of quail have been received from Mexico without showing any cases of epizootic discussed in our last two reports, although several of the birds have died.

The infection among the parrots occurring late last winter ceased shortly after making the report and to date this winter nothing like it has appeared.

The presence of enteritis among the carnivorous animals has frequently suggested a probable relation to the meat fed to them. Last spring a complete revolution of butchering and distribution was instituted. The butcher shop was newly plastered and screened, the icebox renovated and covered galvanized iron pans fitted to the wheelbarrows for carrying the meat to the houses. It was arranged to disinfect the pans regularly. It is too early to make comparison upon reliable data gained before and since these new regulations but it is my impression that there is less enteritis, both clinically observed and pathologically determined at the autopsy table, since this rigid meat hygiene has been in force.

Dr. Balduin Lucké has been added to the staff of the laboratory as a research worker and will give his attention first to the study of heart and vascular diseases in wild animals. Aneurysms seem to occur with rarity among our specimens, a condition possibly based upon the absence of nervous hypertension common in human beings. Nevertheless arteriosclerosis is not uncommon in wild

animals, although apparently it does not lead to vascular dilatation.

Dr. Weidman has continued to study the parasites and reports in the Journal of Parasitology, December 1916, a new species of arachnid, *Cytolichus penrosei*. His report and that of Dr. Schumann upon the lesions of the genitalia, appear later.

During the year the only other contribution made from the laboratory concerned a colonic pigmentation in a monkey, that is a fruit and vegetable eating animal, comparable to a form seen in human beings and ascribed to the action of an intestinal ferment upon certain proteins. This is being made the subject of further study.

Many animals come to autopsy with a history of palsy or actual paralysis of the extremities, notably the hind legs and for which observation no adequate gross cause can be found. In a few cases a minor grade of nerve tissue degeneration has been observed and Dr. Cadwalader and I have discussed the possibility of a degenerative neuritis and myelitis in all such cases. This problem is now before us and we may learn something as to the causation of the disability and perhaps a clue as to its relief. It should be added that this loss of power is not confined to wild animals but is frequently seen in cats and dogs; in these animals it has usually but not always been accompanied by finding worms in the muscles or intestinal canal.

The museum has had 110 new additions, so that now 900 specimens are on the shelves. For the past few months the brain of every valuable specimen has been removed, our collection numbering 61. We shall remove all brains until we have duplicates of every principal zoological division. Already we have arranged to supply material to Dr. S. W. Orton, of the Pennsylvania Hospital, who is making comparative studies of the gross and cellular construction of the cerebral cortex. This gentleman will return half of the brain submitted and a drawing of the architecture of the other half.

The following is a list of the animals dying during the

year. The total will be found not to tally with the records upon the table, as some specimens have died from injury and some were decomposed. Moreover, in many instances animals are included in the figures of more than one heading, since lesions of importance may have been found in more than one of the anatomical systems. It is seldom the case that only one of the systems is sufficiently affected to be the only cause of death.

Total animals examined, 339.

Total *MAMMALIA*, 90.

Primates, 22; Lemures, 2; Carnivora, 32; Rodentia, 8; Hyraces, 1; Ungulata, 18; Edentata, 1; Marsupialia, 6.

Total *AVES*, 247.

Passeres, 108; Picariæ, 7; Psittaci, 47; Striges, 4; Columbæ, 3; Galli, 14; Fulicariæ, 1; Accipitres, 13; Alectorides, 4; Gaviæ, 2; Impennes, 1; Herodiones, 11; Odontoglossæ, 1; Anseres, 29; Struthiones, 1.

Total *REPTILIA*, 2.

Squamata, 2.

Diseases of the digestive system:

Gastritis: Primates, 8; Carnivora, 11; Rodentia, 2; Ungulata, 2; Marsupialia, 2; Anseres, 2; Alectorides, 2; Accipitres, 4.

Enteritis: Primates, 5; Lemures, 1; Carnivora, 15; Rodentia, 1; Ungulata, 3; Marsupialia, 1; Passeres, 24; Picariæ, 3; Psittaci, 15; Striges, 3; Accipitres, 8; Columbæ, 1; Galli, 2; Alectorides, 4; Herodiones, 5; Anseres, 9; Struthiones, 1.

Typhlitis: Ungulata, 1; Galli, 3; Anseres, 1.

Proctitis: Herodiones, 1; Psittaci, 1; Picariæ, 1.

Appendicitis: Primates, 1.

Hemosiderosis of intestine: Primates, 1.

Peptic ulcers: Hyraces, 1.

Liver:

Acute (degenerations, inflammations, &c.): Primates, 3; Lemures, 1; Carnivora, 3; Ungulata, 1; Edentata, 1; Passeres, 1; Picariæ, 1; Psittaci, 11; Striges, 1; Accipitres, 4; Alectorides, 3; Anseres, 7; Struthiones, 1.

Chronic (cirrhoses, &c): Primates, 3; Carnivora, 1; Ungulata, 1; Marsupialia, 1; Psittaci, 2; Galli, 1.

Cholangitis: Accipitres, 1; Galli, 1; Anseres, 2.

Cholecystitis: Carnivora, 1; Marsupialia, 1.

Choledochitis: Carnivora, 1; Marsupialia, 2.

Cholelithiasis: Carnivora, 1.

Pancreas:

Pancreatitis: Carnivora, 3; Ungulata, 1; Passeres, 2; Herodiones, 1.

Hemorrhage: Rodentia, 1; Psittaci, 1.

Diseases of the circulatory system:

Pericarditis: Primates, 2; Carnivora, 1; Ungulata, 1; Passeres, 1; Anseres, 4.

Myocarditis: Primates, 2; Carnivora, 2; Marsupialia, 1; Accipitres, 1.

Endocarditis: Carnivora, 1; Anseres, 1.

Arterial disease: Primates, 1; Carnivora, 1; Marsupialia, 1; Accipitres, 2; Alectorides, 1; Herodiones, 1; Anseres, 1.

Thrombosis: Primates, 1; Accipitres, 1; Anseres, 1.

Brown atrophy and Zenker's hyaline in heart muscle: Ungulata, 1.

Anemia: Primates, 3; Carnivora, 3; Rodentia, 1; Passeres, 1; Herodiones, 1.

Diseases of the genito-urinary system:

Nephritis:

Acute: Primates, 4; Carnivora, 10; Rodentia, 1; Ungulata, 4; Marsupialia, 1; Passeres, 4; Psittaci, 2.

Chronic: Primates, 3; Carnivora, 3; Ungulata, 2; Galli, 1; Anseres, 2.

Polycystic: Anseres, 2.

Cystitis: Carnivora, 1; Marsupialia, 2.

Postpuerperal hemorrhage and subinvolution: Primates, 1.

Salpingitis: Anseres, 2.

Mastitis: Carnivora, 1.

Broken egg: Anseres, 1.

Congenital cystic uterus: Carnivora, 1.

Diseases of the respiratory system:

Pneumonia: Passeres, 1; Psittaci, 1.

Broncho-pneumonia: Primates, 2; Carnivora, 2; Passeres, 4; Psittaci, 1.

Septic pneumonia: Carnivora, 1.

Chronic interstitial pneumonia: Primates, 1.

Bronchitis: Primates, 3; Carnivora, 1; Ungulata, 1; Marsupialia, 1; Psittaci, 1.

Congestion of lung: Primates, 1; Marsupialia, 1; Passeres, 12; Psittaci, 7; Striges, 2; Columbæ, 1; Alectorides, 1; Struthiones, 1.

Naso-Pharyngitis: Primates, 1; Carnivora, 1.

Rhinitis: Anseres, 3.

Diseases of the lymphatic system:

Splenitis: Primates, 6; Carnivora, 8; Rodentia, 2; Ungulata, 1; Marsupialia, 1;

Edentata, 1; Passeres, 17; Psittaci, 17; Accipitres, 4; Striges, 2; Galli, 1;

Herodiones, 4; Alectorides, 4; Anseres, 3.

Fibrosis: Marsupialia, 1.

Hemosiderosis: Primates, 1.

Cystic lymphadenitis: Carnivora, 1.

Lymphadenitis: Primates, 3; Carnivora, 6; Rodentia, 1; Ungulata, 2.

Diseases of the skeleton:

Osteomalacia: Primates, 1; Rodentia, 2; Galli, 1.

Cretin: Carnivora, 1.

Rickets: Primates, 1.

Diseases of the serous membranes:

Pleuritis: Primates, 1; Ungulata, 1; Marsupialia, 1; Passeres, 2; Accipitres, 2; Anseres, 1.

Serositis: Passeres, 7; Psittaci, 4.

Peritonitis: Lemures, 1; Carnivora, 1; Ungulata, 1; Marsupialia, 1; Passeres, 1; Psittaci, 1; Accipitres, 1; Galli, 2; Anseres, 2.

Infections:

Tuberculosis: Primates, 1; Psittaci, 2; Passeres, 1; Picariæ, 2; Carnivora, 1; Ungulata, 1; Accipitres, 1; Galli, 1; Columbæ, 2; Anseres, 2.

Mould infection: Passeres, 9; Psittaci, 3; Striges, 1; Gaviæ, 2; Galli, 1.

Acute general infections (septicemia, &c.) Carnivora, 2; Edentata, 1; Passeres 1; Psittaci, 1; Anseres, 1.

Waterfowl epizootic: Anseres, 5.

Miscellaneous:

Tumors: Primates, 2; Carnivora, 1; Ungulata, 1; Hyraces, 1; Passeres, 2; Picariæ, 1; Anseres, 1; Herodiones, 1.

Thyroid disease: Primates, 1; Carnivora, 9; Marsupialia, 1; Psittaci, 1; Alektorides, 1; Anseres, 1.

Adrenal disease: Ungulata, 1; Primates, 1.

Keratitis and Iritis: Galli, 1.

SECTION II.

TUBERCULIN TESTS AND TUBERCULOSIS.

The quarantine rooms held no monkeys at the beginning of the year for which this report is made, but 13 new specimens were received and 22 old ones were returned for various reasons, thus making a total of 35 tuberculin tests for the year. The mortality among the primates is 22 or 26% of exhibition specimens.

YEAR ENDING.	Number exhibited during year.	Total dying.	Number tubercu- lous.	Per cent. of deaths tubercu- lous.	Per cent. of mor- tality from tuber- culosis.
February 28, 1906		77	60	78
February 28, 1907		33	18	55
February 28, 1908		24	3	12.5
February 28, 1909		26	0	0
February 28, 1910		25	3	12.5
February 28, 1911		30	5	16 $\frac{2}{3}$
February 28, 1912 88		34	12*	35*	14
February 28, 1913 94		38	19*	50*	20
February 28, 1914 83		23	0	0	0
February 28, 1915 82		19	5	26	6
February 28, 1916 81		12	2	16 $\frac{2}{3}$	2.4
February 28, 1917 84		22	1	4.5	1.2

*See 1912 and 1913 reports for explanation of these high figures.

Only one case of tuberculosis occurred among our exhibition specimens and for that I cannot account otherwise than as a visitor infection. It seems impossible that it could have been a long case with latency and sudden or rapid development for a short time before death, as the monkey concerned, Sooty Mangabey, has notoriously no resistance to the disease and progresses rapidly to a fatal outcome when once infected. This specimen (Sooty Mangabey 74) was received 5/13/13 and passed on a good chart to a cage where no tuberculous monkeys were or subsequently developed. It was returned to the quarantine rooms at the time of the general injection in 1914 and was passed to an outside cage whence it was returned to the laboratory and then to the monkey

house where it was in three different cages during the next two years and according to our records not exposed to any tuberculous animal. It died in May 1916 with widespread, actively progressive lesions.

Tuberculosis among the other animals remains about as last year, there being a numerical increase of two cases. There appear two cases among the parrots, an order missing in last year's survey. Fortunately there is no great increase approaching the cases in former years. The list shows Carnivora, 1; Ungulata, 1; Passeres, 1; Picariæ, 2; Psittaci, 2; Accipitres, 1; Columbæ, 2; Galli, 1; Anseres, 2.

Tumors observed during the year and placed on record are as follows:

3988. Sebastopol Goose (♀) (*Anser domesticus*), leiomyoma, with spindle cell sarcomatous change in left kidney region.

3991. Polar Bear (♂) (*Ursus maritimus*), adenocarcinoma of adrenal, with metastases to lung, diaphragm and lymph gland.

4068. Common Marmoset (♂) (*Calithrix jacchus*), Hyperplasia of bone marrow, with myelomatous nodule in the pancreas.

4081. European Blackbird (*Merula merula*), Hypernephroma, with metastases to liver.

4092. American Robin (♀) (*Turdus migratorius*), Hypernephroma of kidney.

4120. Least Bittern (♂) (*Botaurus exilis*), Adenocarcinoma of duodenum.

4185. White-crested Touracou (♂) (*Turacus corythaix*), Adeno-carcinoma of pylorus, with tuberculous enteritis in the vicinity.

4189. Toque Monkey (♀) (*Macacus pileatus*), Soft papilloma of cervix uteri growing as a fungoid mass filling vagina.

4208. Cape Hyrax (♂) (*Procavia capensis*), Squamous cell papilloma of cardiac stomach.

4209. Giraffe (♀) (*Giraffa camelopardalis*), Adenoma of biliary passages due to parasites (*unicinaria*). This

neoplastic effect of the worms is very striking and calls to mind the observations of Fibiger. This pathologist found an adeno-carcinoma in the stomach of rats due to a nematode transmitted by the cockroach. His observations and work seem acceptable and are unique. Tumor of the pituitary. The position of the pituitary is occupied by a wide flat mass 40 x 50 mm. of a red gray color and firm uniform consistency.

ANEMIAS.

During the year four cases of what was probably primary anemia occurred, three in monkeys and one in a bassaris. In all cases careful search was made for parasitic infestation without such a discovery, and, in three cases, two monkeys and the bassaris, the investigations included a thorough hunt for a focal infection.

Animals do not frequently come to autopsy with a picture similar to that of pernicious anemia of the human being, so that when one meets the complete picture, as shown by the Japanese Macaque No. 16, the impression is distinct. The case in which this occurred is given in detail. The other cases are merely listed.

NOTE.—No. 4046 Japanese Macaque No. 16. Drooping since August 24th, 1916. Died September 12th, 1916. Aplastic anemia, chronic hypertrophic gastritis, atrophy of heart muscle with regeneration, hemosiderin pigmentation of liver, peribulbar fibrosis of liver, slight cloudy swelling of liver, chronic diffuse nephritis (subcapsular type), congestion of spleen, fibrillar fibrosis of spleen, hemosiderin pigmentation of spleen, local amyloid infiltration of spleen, calcareous infiltration in medulla of adrenal. Coat is only fair, body emaciated, muscles pale and fat scanty. Respiratory tract normal throughout save for slight emphysema. Epicardium thickened and slightly diffusely congested. Heart muscle pale, soft and flaccid. Liver slightly decreased in size, smooth surface, sharp edges, hard, rusty brown color, with a glistening smooth and moist section surface. Gall bladder is distended with fluid green bile and the duct is patulous. Spleen is of normal size, firm, smooth capsule, showing dark reddish brown section surface with distinctly visible trabeculae. Kidneys are decreased in size, of hard consistency, pinkish gray color, capsule smooth and strips easily leaving a smooth surface. There is poor demarcation between cortex and medulla. Adrenal has thick orange yellow cortex and solid small brown medulla. Stomach is distended with gas and a small quantity of yellowish brown mucus, mucosa everywhere normal. Postmortem blood examined and stained by Romanowsky but the red cells are disintegrated so examination is unsatisfactory.

HISTOLOGICAL NOTES.—Heart shows normal epicardium quite free of fat. Myocardium is peculiar in that the fibers immediately under epicardium show marked broadening in a very narrow rather sharply indicated zone where nuclei are extremely large although not specially chromatic; transverse markings here easily although faintly recognized; the fibers have very indefinite borders, their longitudinal fibrillae being ranged in form of a coarse reticulum; this comes about from frequent and extensive lateral anastomoses with fellow fibers giving appearance of a syncytium. In deeper parts fibers are of more common size but nuclei are still large and fibers, now cut in transverse section, do not appear to anastomose so freely. There appears to be a slight excess of fibrous tissue in

these deeper parts. Arteries quite normal. Liver capsule and interstitial parts are on the whole normal. Perilobular fibrous tissue largely missing, but where remaining shows an overgrowth occurring in peculiar zonal arrangement and of old adult almost hyaline type. Its fibers are often arranged strikingly in whorls. Bile ducts, arteries, and veins quite normal. Parenchymal cells of normal size, finely granular, prominent normal nuclei and contain small quantities of granular golden brown pigment not nearly so abundant as commonly seen in severe anemias. Blood capillaries narrow and contain small quantities of red blood cells, and Kupfer's cells very frequently contain fine granules like those of parenchymal cells but of a greener tint. In a few isolated areas parenchymal cells are distinctly more swollen than others and many show disintegration of nucleus. Kidney capsule smooth, interstitial fibrous tissue of organ proper highly fibrosed in peripheral parts but slightly in deeper. No lymphatic infiltrations or sclerosis of vessels anywhere. Tubular epithelium highly atrophic in subcapsular regions where, too, tubules are narrow. In deeper parts epithelium is at times so swollen as to occlude lumina, where it is coarsely granular and occasionally show some karyolysis. On the whole lumina are wide open rarely containing a pink hyaline or granular material. Tufts never show fibrosis. Bowman's capsule heavily thickened. Spleen shows slightly hyalinized capsule normal in thickness. General reticulum of pulp slightly fibrosed and poor in lymphocytes. Sinuses broad and crowded with red blood cells and small numbers of lymphocytes. Coarse granular blood pigment abundant showing greenish cast on focusing. Malpighian follicles normal in size, slightly fibrosed and in several instances a deposit of smooth pink material between its cells. Adrenal appears normal in all respects save for presence of a few small irregular areas of calcification in medulla. These appear apart from any recognizable necrotic or fibrous areas. In one place one appears to lie within lumen of blood vessel. No fibrosis or special congestion anywhere in organ and cells show normal details and normal numbers of vacuoles. Stomach shows normal muscular tunics. Submucosa thin, has densely arranged bundles of smooth pink character. Mucosa distinctly thinned shows comparatively few areas holding acid cells, consisting for most part of peptic type of gland. These are short and of broader calibre towards lumen than deeper, suggesting a hyperplasia of luminal portion. Stroma richly infiltrated with lymphocytes, not fibrosed or congested. Epithelium of crypts has rarefied appearance, shows no special degeneration. Bone marrow appears as widely separated large fat globules with intervening granular edematous material and no hæmopoietic elements. Blood capillaries numerous and highly congested. Cord shows nothing abnormal in any part.

4177. Rhesus Macaque, 180, Primary anemia, pleural and peritoneal adhesions, hyperplasia of bone marrow, acute catarrhal bronchitis, pigmentation of spleen, liver, and lymphnodes.

3906. Rhesus Macaque, 156, Anemia, fatty degeneration of liver, chronic peritoneal adhesions, old rickets.

3948. Ring-tailed Bassaris, Primary anemia, fatty infiltration of liver, hemorrhages in intestine and spleen, hyperplastic bone marrow.

CRETINISM.

Last year a report was made of the birth of some cretin wolves from a healthy mother. Another litter has been born to this female and a more complete history has become available, which, with a survey of the situation and the conclusions, are herewith appended.

The material presented consists of the offsprings of a female gray wolf impregnated three times, by two different male wolves. On the first occasion she gave birth to two male cubs, which died within three days and were apparently normal; they were probably not taken care of. The

thyroid retained the foetal type and was approximately correct in size. In 1915, a year after the birth of these two, she gave birth to seven pups, two of which died almost immediately and were not posted. The other five died in from two to seven months and were all cretins or cretinoid. These beasts all show imperfect development of the skeleton and retention of a large amount of cartilaginous structure. Two of them had hemorrhagic pachymeningitis, one being the external form. The pituitary body was not anatomically altered. The father of these litters died on the 11th of May, 1915, of acute fermentative gastritis, with dilatation. He showed foetal adenoma of the thyroid. The pituitary was lost, but it was not grossly altered. He was a well developed specimen and showed no evidences of goitre or myxœdema. On March 31st, 1916, seven pups were born. One was killed because it was a cretin; a second was killed because it was a runt and could not move around, a disability found to be due to fracture of both femora. Five remain alive, three of which are runts; the other two are normally formed, fair specimens, except for weakness of the hind legs. The runts show some enlargement of the neck; the larger ones do not. The mother was recently examined and showed no thyroid enlargement. The father is a splendid specimen of the gray timber wolf without any thyroid enlargement. Beginning late in June, these runts were fed with chopped horse thyroid. One markedly improved, another slightly, a third not at all; this one may have been too weak to get his portion of food. The noteworthy points in the history are: First, the throwing of two litters of preponderantly cretin pups by a perfectly healthy mother and good specimen, following the first litter of pups, which were apparently normal; secondly, the presence of goitre in one father and its absence in the father of the last litter. This carries out previous observations that cretinism may be carried by the mother; thirdly, while there is an imperfect development of the skeleton, it is in most cases an orderly development as far as it goes and is architecturally correct, the outlines

more graceful than in rickets, the uncalcified areas in the epiphysis being only occasionally disorderly; fourthly, absence of callus about the fractured bone; fifthly, the effect of thyroid treatment upon the young ones; this has not been as satisfactory as can usually be promised in human cases.

It seems worth while to make a survey of our 4225 autopsies for the purpose of discovering the orders in which constitutional bone diseases have occurred with the hope that it might indicate something in the line of feeding. Before discussing the table it is only correct to state that in my own work, and from the records, in that of my predecessor, Dr. White, two groups of bone changes have been recognized and named, developmental or rickets including all the congenital forms or those shown in early life, and retrogressive or osteomalacia, an abnormally active bone absorption in adult life. There are subdivisions in a pathological sense, such as chondrodystrophy, which are not necessary to make since the underlying factors of faulty development or repair are probably similar. What was hoped for was an indication of faulty breeding or feeding. I do not presume to be naturalist enough to evaluate fully the effect of captivity and possible inbreeding upon specimens but it would certainly seem that the primates are most affected in bony development by confinement and artificial food. Whether these bone changes occur more here than in the wild of course is unknown. The Carnivora are also well represented. The absence of the chase and its developmental influence must be considered. It is noteworthy that in the Mammalia the orders Ungulata and Marsupialia, of which we have had a large number, are missing. It is possible that the food of these orders in captivity is not so far from the natural kinds as is the case with the above named orders.

Among the Aves one misses the very large order Passeres and the Anseres. There seems little upon which to comment in this class because orders of different habits are represented and lacking. It is noteworthy that developmental diseases are all among the Mammalia,

none being observed in Aves. The large number of osteomalacia cases in primates include the well known cage palsies ascribed to confinement purely.

RACHITIS.

Primates.....	8
Lemures.....	3
Carnivora.....	6
Rodentia.....	1

OSTEOMALACIA.

Primates.....	22
Carnivora.....	3
Rodentia.....	4
Hyraces.....	1
Columbæ.....	5
Psittaci.....	3
Galli.....	3
Accipitres.....	1

DR. WEIDMAN'S REPORT.

Of the 339 animals autopsied this year 44 showed worms of one kind or another, a percentage of 12.9. The number is exactly the same as for last year for which there was a percentage of 11.4. There were two small special groups of worms occurring in special animal groups, *i. e.* Uncinaria in Carnivora and Tropicocerca in cranes and a flamingo. The latter worms are non-pathogenic in spite of their blood-red color and position deep in the proventricular crypts, for our concave-casqued hornbill has passed ova of this genus for five years and appears well. The uncinaria cases were in wild cats and ocelots which had been in the garden not longer than three months in any case and were therefore certainly infested upon arrival.

Two papers have been contributed this year on parasitological subjects. The first was published in the Journal of Parasitology 1916, Vol. III, No. 2, page 82 entitled "Cytoleichus penrosei*, A New Arachnoid Parasite Found in the Diseased Lungs of a Prairie Dog, Cynomys ludovicianus". It described an arachnoid of importance, since it produced a fatal broncho-pneumonia. Similar organisms have been found by Wellman and Wherry in the lungs of California ground squirrels. The parasites

* Dedicated to Dr. Charles B. Penrose.

of the prairie dog are not well known, doubtless because their bodies generally remain underground when they die of disease. This makes the second original observation on them from these gardens, *Trichisoma hepaticum* having been reported last year; and during our control examinations of the feces of prairie dogs bought more than a year ago for trichosoma research, we have found a third. This is a strongylus larva,—certainly nonpathogenic, since all six of the animals infested are gaining in size and are perfectly healthy.

The second paper is technical, entitled "A Method of Obtaining Duplicate Reconstructions from the One Series of Wax Plates"—New York Medical Journal, 1917, Vol. CV, No. 9, page 400. The subject matter was furnished by a fluke, *Cladorchis* (*Stichorchis*) *subtriquetum*, from the cecum of a beaver dying in these gardens.

ANIMAL PARASITES IN LARGE CARNIVORA.

In March 1916 the feces of all the Carnivora in the exhibition house were examined for intestinal parasites. We had known for several years that a female jaguar had tapeworm of the genus *Dibothriocephalus* because it had passed links for several years past, and in addition at least two lions had voided or vomited round worms at one time or another. We suspected, from these, that perhaps the poor condition of some of the animals might be due to intestinal parasites, but were agreeably surprised to find a large majority of the animals with a perfectly clean bill of health in this respect. The results are detailed below.

Spotted Wild Cat—Fairly numerous ascaris ova.

Female jaguar—Enormous numbers of segmented dibothriocephalus ova.

Male jaguar—Ova similar to those in female but not so numerous.

Snow leopard—Fairly numerous ascaris ova, segmented and containing early larvæ.

New lioness—Very few ascaris ova.

Young hyena—Very few hookworm ova, segmented.
(Only one ovum in five slides.)

Grizzly bear—Few cestode ova.

Male blue bear—Motile larvæ (hookworm or strongylus).

Domestic cat—Maltese—Numerous nematode ova.

Domestic cat—Black—Few nematode ova.

The following animals showed no signs of intestinal animal parasites of any kind:—three lynx, three lions, four leopards, one civet, two tigers, two hyenas, one blue bear (female), two kaffir cats.

Out of 26 wild animals, then, less than one-third were infested. Those infested showed either large numbers of relatively nonpathogenic parasites or small numbers of more pathogenic ones, with the exception of the jaguars. It is not felt, therefore, that the benefit to be derived from treatment would be commensurate with the danger to these animals which arises when they are restrained. Special treatment for the badly infested jaguars was unsuccessful, the beasts refusing meat in which malefern was concealed, but we are successful in regularly administering santonin.

The domestic cats, it will be noted, showed but one kind of ovum (the common round worms of cats) and cannot be considered as disseminators of animal parasites there.

The feces of the Canada lynx adjacent to the puma cages were also examined. One was quite free of parasitic ova, a second showed extremely small numbers (one in two slides) of ascaris ova and the third very small numbers of hookworm ova (one in one slide). Only the latter causes us any concern, but they are in very small numbers, and conditions in their cage are not suitable for the development of the dejected ova into worms.

NONPATHOGENIC AVIAN ARACHNOIDS.

During the routine examination of newly arrived parrots' droppings for spiroptera ova we found several species of arachnoids. Two golden-crowned conures were

thus affected and the source of the parasites traced to their feathers by also finding them, alive, in their "flutterings" and not in *freshly voided* droppings after castor oil. In determining the source, the sunflower seeds we use were found free of any kind of metazoan parasites or their ova. The parasites belong to the Plumicoles (genus *Megninia*), and are nonpathogenic, feeding upon the detritus of the feathers. I have gone partly through the literature and these are probably new species.

COCCIDIOSIS IN HIMALAYAN THARS.

Following the death of a young thar with a hemorrhagic and ulcerative enteritis in which this protozoan was found, the feces of its cage mates were examined, resulting in the isolation of a young thar which was only slightly infested and apparently in good health. The organism is another new species (which we cannot study on account of time limitations) whose congener, *Eimeria faurei*, produces fatal bloody diarrhea in young Swiss cattle. These parasites multiply in situ, for which reason a light infestation has a significance quite different from the hookworm infestations in the lynx and hyena. Furthermore the oocysts are persisting (after castor oil) unlike those of the swift fox (1916 Report, page 39), and with sufficient multiplication will produce recognizable disease. Its feces also show whip-worm and strongylus ova. We are keeping the animal in isolation for observation and hookworm research.

TRICHOSOMA HEPATICUM IN PRAIRIE DOG.

Last year we reported the discovery of ova, in the liver of a prairie dog, which are commonly found in wild rats, and that we proposed to feed ova from rats to prairie dogs with the hope of producing a fatal disease that might be considered as an exterminant. The research is continuing; slowly because it takes such a long time (3 months or more) for the eggs to incubate. We have, so

far, fed one batch of eggs to a prairie dog, first performing laparotomy to make sure it was not already infested; but the control rat failed to develop the disease. This indicates that the ova were not in the infestive stage even though they contained motile larvæ. Further feedings will be made shortly.

TRICHINA SPIRALIS IN THE POLAR BEAR.

Encysted forms of this worm were found in almost unbelievable numbers in the above animal at autopsy. Since rats are possible, and in some localities, common, transmitters of the disease, we examined fifty which were caught in different parts of the garden but in no case with parasitic findings. This shows that the bear probably brought the disease with him from the arctics and certainly that our wild rats are not transmitting the disease to other carnivora.

TRICHINOSIS IN COLD BLOODED ANIMALS.

The recognition of trichinosis at the autopsy in the polar bear raised the question whether other animals in the garden might not also be affected. As rats and pigs are the common transmitters we thought of the snakes to which both these animals are fed. Although this was not thought likely, nevertheless a King snake was fed on an experimentally infested trichina mouse. The reptile died spontaneously 102 days later, which is three times as long as is necessary for the parasites to develop. The muscles were examined thoroughly for trichinosis but none was found. They did contain filariæ, adult and larval, and larvæ were also found in the intestine, but resembling more those of a filaria than a trichina. The latter were fed and injected intraperitoneally into white rats without reproducing the disease. After our experiment had started we found that Gujon has also been unsuccessful in infesting cold blooded animals, but that salamanders contracted the disease when kept at a temperature of 30°C. We conclude that there is no danger, then, even if we should feed trichinous

pigs and rodents to our reptiles, and that there is no necessity for examining these animals prior to feeding.

HOO KWORMS IN THE LIVER OF THE GIRAFFE.

Two years ago I reviewed the literature on hookworms in a publication in relation to its distribution among the lower animals, mention of which was made in last year's report (pages 21 and 36). In the literary search I found no reference to this parasite as occurring in the giraffe, and never anywhere except in the intestines. This finding is, therefore, unique in two respects. The worms were fairly numerous, numbering 27, were about an inch long and produced a marked local dilation of bile ducts with surrounding cirrhosis. While they did not cause the death of the animal they surely produced disease in an important metabolic organ. I have partly determined it already as a new species, and am incubating ova in moist sand. As soon as they develop into the infestive stage I will try to transmit the parasite to the young thar in isolation.

PSITTACIC SPIROPTERIASIS.

Sixty-nine newly arrived parrots were examined routinely the past year for Spiropteriasis with negative findings in every case.

OBSERVATIONS BY DR. E. A. SCHUMANN UPON INTERESTING CONDITIONS FOUND IN THE FEMALE GENITAL TRACT.

3925. Common Marmoset (*Midas geoffroyi*). Puerperal relaxation of uterus with fatal hemorrhage. A puerperal uterus and appendages is presented. The uterus is 4 cm. long, 15 mm. wide at intertubal line. Uterine wall averages 2 mm. in thickness. Peritoneal surface as smooth, glistening and intact. Uterine musculature is soft and relaxed. Entire organ intensely congested and on section uterine cavity contains a large firm blood clot completely filling it. Mucosa is of deep purple color, shows many fragments of decidua and is the seat of profuse hemorrhage.

3951. Lion cub (*Felis leo*). Congenital cystic uterus. The only abnormality found is in connection with the internal genitalia. The vagina 50 mm. long, uterus measures 23 mm. long, horns of uterus each 90 mm. long. Diameter of uterus measures 10 mm. in both body and cornua, the latter being distended by clear watery fluid. They are symmetrically curved downward. They show no adhesions or obliteration of os uteris to account for fluid retention. The probe is readily passed from the vagina to end of uterine horns. Vagina is patulous through its whole course. Ovary and tube normal.

A NOTE UPON THE PLACENTATION OF THE COMMON RACCOON (*Procyon lotor*).

On examination of the placenta and foetus of the animal there was found a feature apparently normal but not previously noted among Carnivora. At a point on the uterine surface of the zonary placenta just opposite the insertion of the umbilical cord, there occurred a punched out circular gap in the continuity of the placenta, 1 cm. in diameter. The hole was filled with organized blood clot, stained dull yellow about the edges evidently with hematoidin. On the uterine surface of the placenta there was found a deep red nipplelike bulb of tissue, apparently blood clot enclosed within a delicate membrane. The membrane sprang from the entire circumference of the gap in the placenta and when filled with blood clot formed a pouch 1 cm. in diameter and about 15 mm. in length. This pouch protrudes into the amniotic cavity. On microscopic examination the covering membrane was found to be chorion, the villi markedly developed, interlacing and forming the bulk of the tissue. Organized blood clot was found to fill the pouch of membrane so formed. Reference to the literature of the subject showed that Bischoff (Sitz. bericht. Akad. Wissensch. München 1865) had reported a similar condition found in the stone marten (*Mustela foina*) European otter (*Lutra vulgaris*) and weasel (*Mustela vulgaris*).

It had not been noted in the other species of the Carnivora. Bischoff's explanation of the occurrence is that there is an absence of utricular glands on the internal surface of the uterine cornua and that the syncytium fails to imbed in this area thus causing the solution of continuity in the placenta. The chorion develops over the gap and, becoming distended with effused blood, forms the pouch under discussion. In the specimen here observed there were two pregnancies, at about three-fourths maturity and both placentæ revealed identical pouches. The common raccoon is therefore added to the small list of the carnivora presenting this placental peculiarity.

FETUS OF RAT KANGAROO.

At 7 a. m. on the morning of February 28th, 1917, there was found in the cage of the Rufous Rat Kangaroos an apparently full term foetus, which probably had never been in the pouch. It weighed 0.6 grams. There was a delicate transparent membrane over the body and eyes, ears, and nostrils. A small placenta was present attached by a cord 4 mm. in length. The body exclusive of tail measured 16 mm. long, occipito-mental 6 mm., bitemporal 4 mm., trochanteric 5 mm., tail 7 mm., hind leg 2 mm., foreleg 6 mm. Tail was tightly curled to belly and could not be straightened out. Hind legs were short and thick showing three rudimentary toes. Fore legs were longer and showed five well developed claws. Through the delicate skin deep, slow breathing could be observed and some motion of the intestines. There was slight motion of hind legs but none of tail. Considerable motion of head and particularly of fore legs. When touched claws of fore legs quickly closed over forceps firmly enough so that the animal was dragged about three inches. When a few drops of warm water was placed over the body the motion of the fore legs became very active and mouth opened simultaneously suggesting an attempt to draw the nipple into the mouth. Motion was observed until 1 p. m., six hours after it was found. (See 1916 Report, page 31.)

Respectfully submitted,

HERBERT FOX,
Pathologist.

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2. **JUNIOR.**—These are minors whose membership expires when they reach the age of eighteen years. They make one payment of five dollars when elected.

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Members are admitted to the Garden during the time it is open to the public, which is from 9 A. M. until sunset, every day in the week, including Sunday and have the privilege of consulting the books in the library, subject to the rules and regulations of the Society.

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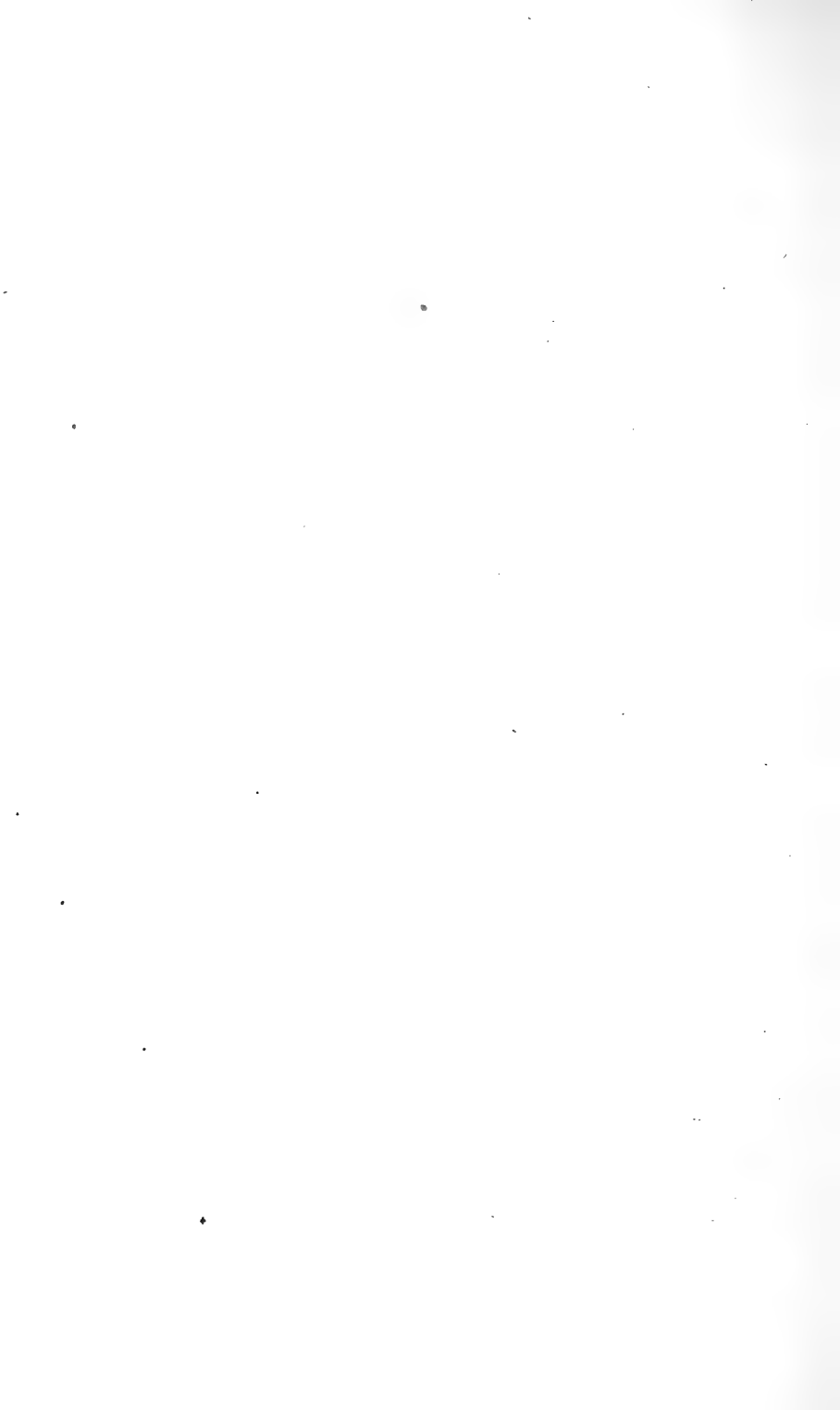
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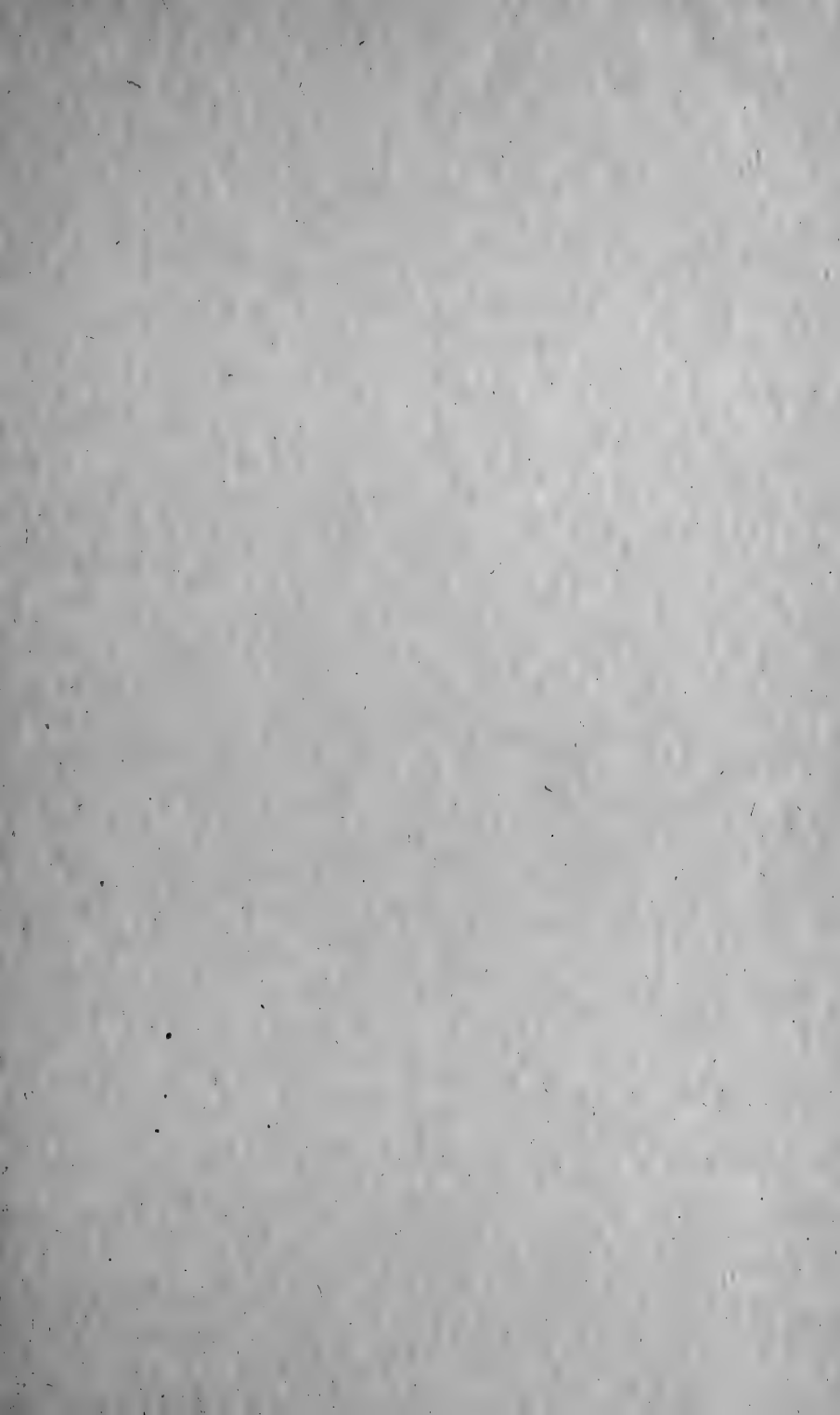
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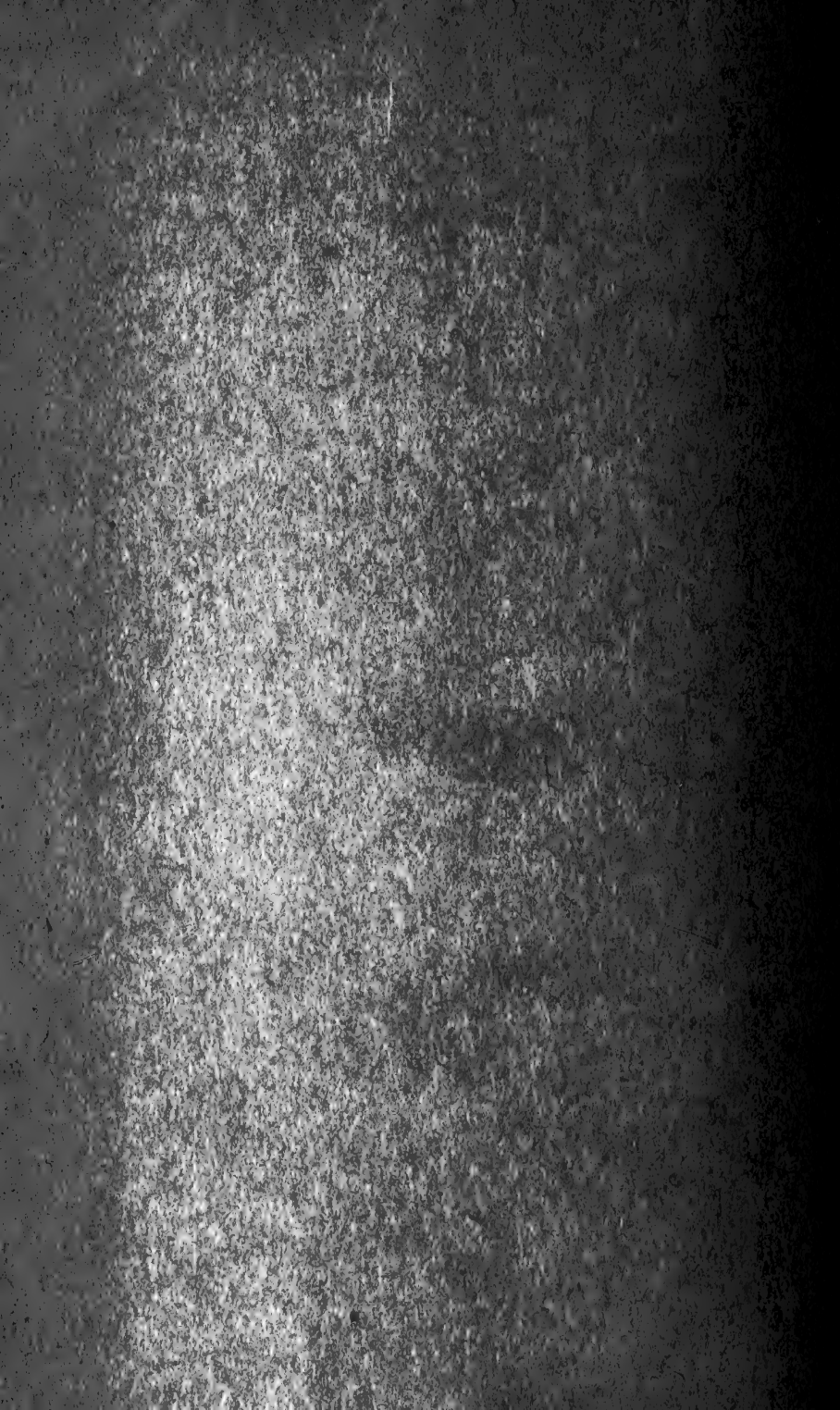
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